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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,326	02/07/2006	Shoji Sekino	NEC NE70217	6649

27667 7590 05/27/2009

HAYES SOLOWAY P.C.
3450 E. SUNRISE DRIVE, SUITE 140
TUCSON, AZ 85718

EXAMINER	
ENIN-OKUT, EDU E	
ART UNIT	PAPER NUMBER
1795	
MAIL DATE	DELIVERY MODE
05/27/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/567,326	SEKINO ET AL.	
	Examiner	Art Unit	
	Edu E. Enin-Okut	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 February 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) *2* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

ELECTRODE ACTIVE BLANKS AND METHODS OF MAKING

Detailed Action

1. The amendments filed on February 9, 2009 were received. Applicant has amended claims 1, 5, 6 and 7; and, cancelled claim 2. Currently, claims 1 and 3-12 are pending.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Drawings

3. The objection to the drawings under 37 CFR 1.83(a) are maintained. The drawings must show every feature of the invention specified in the claims. Therefore, the "*shutter member* including a cut portion formed therethrough" (emphasis added) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. (It should be noted that the portion of the specification that applicant discusses in its remarks on p. 7 with respect to this "cut portion" is in reference to the element being present in the elastic film of the permeation control film, not the shutter member.)

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet"

pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

4. The rejection of claim 7 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention, is maintained. As noted above, the portion of the specification that applicant discusses in its remarks on p. 7 with respect to this "cut portion" is in reference to the element being present in the elastic film of the permeation control film, not the shutter member.

Claim Rejections - 35 USC § 102

5. The rejection of claims 1 and 11 under 35 U.S.C. 102(b) as being anticipated by Horiba et al. (US 4,493,878) is withdrawn because claim 1 was amended.

Claim Rejections - 35 USC § 103

6. Claims 1, 3, 4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horiba. Additional supporting evidence provided by Prasad et al. (US 2006/0256176).

Regarding claims 1, 3 and 4, Horiba teaches a fuel supplier placed in a fuel supply system of a fuel cell (2:30-64; Claim 1), including a fuel vessel [cartridge 2]; a permeation control film coupled to the fuel vessel [net-like substrate material (net) 3 provided in a portion of the cartridge 2]; and, a supplementary fuel [fuel element 1] contained in the fuel vessel (Figs. 1, 2; 2:30-37; Claim 2).

As to the supplementary fuel contained in the fuel vessel being restrictively transmitted through the permeation film to the fuel cell, or allowing the supplementary fuel to move to the fuel supply system

through the permeation control film, these limitations have been considered, and construed as a functional limitation that adds no additional structure to the fuel supplier. See MPEP 2114. However, because the fuel supplier of Horiba is structurally similar to that instantly disclosed, it appears capable of functioning as claimed.

Horiba teaches that its permeation control film is composed of polypropylene net (4:1-2). One of ordinary skill would appreciate that polypropylene can swell when exposed to substances such as methanol (see Prasad, para. 14, 16, 17). That artisan would also appreciate that the amount of swelling of the polypropylene is dependant upon how much of that substance it is exposed to (i.e., the concentration of the substance in a solution). Further, the swelling of a polypropylene net like that taught by Horiba will expand the fibers forming the net, changing its shape and reducing the void volume of the net; thus, restricting the amount of fuel (e.g., methanol-containing fuel) flowing through the net.

Therefore, one of ordinary skill in the art at the time of the invention would have found it obvious to use the ability of the polypropylene net of Horiba to respond (i.e., change its shape) to exposure to liquid fuels, such as methanol, to restrict the amount of fuel supplied by its fuel supplier without adding additional control equipment; thus, achieving a compact fuel cell device (see Horiba, 3:44-46).

Regarding claim 11, Horiba teaches a fuel cell (Fig. 2; 2:55-3:2), including a solid electrolyte membrane [electrolyte 7] (4:19-23); a fuel electrode [anode 5] and an oxidant electrode [cathode 6] placed on said solid electrolyte membrane; and a fuel supply system [fuel element 1, cartridge 2, substrate material (net) 3] that supplies a fuel to said fuel electrode, wherein said fuel supply system has the fuel supplier as claimed in claim 1 (Figs. 1, 2; 2:30-37; Claims 2-3).

7. Claims 5, 6, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horiba as applied to claims 1, 3 and 4, and further in view of Yonetsu et al. (US 7,147,950) is maintained.

Horiba is applied and incorporated herein for the reasons above.

Regarding claims 5 and 8, the limitations recited in these claim have been addressed above with respect to claim 1, except for a shutter member being placed on the fuel permeable film.

Yonetsu teaches a fuel cell with fuel tank 1 having a cylindrical lid 31, which can be opened or closed, is slidably mounted around the fuel outlet port 12 of a liquid fuel tank 1, and a permeating material connecting pad 32 is mounted to the inner wall of the pathway 3 (10:38-43; Figs. 9A, 9B). When the liquid fuel tank 1 is connected to a pathway 3, the lid 31 is pushed upward so as to bring the outlet port of the tank into contact with the permeating material connection pad (10:43-47). When the fuel outlet port is brought into contact with the permeating material connecting pad, the liquid fuel is transferred from the tank into the pathway by the capillary action (10:48-51).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include a shutter member in the fuel supplier of Horiba, as taught by Yonetsu, in order to further control the flow of fuel from the fuel supplier to a fuel cell (see Yonetsu, 10:43-47).

As to the shutter member controlling an exposed area of said fuel permeable film; or, that the shutter member slides on the surface of the surface of the film such that the exposed area of the film is controlled, these limitations have been considered, and construed as a functional limitations that add no additional structure to the shutter member. See MPEP 2114. However, because the shutter member of Horiba, as modified by Yonetsu, is structurally similar to that instantly disclosed, it appears capable of functioning as claimed.

Regarding claim 6, the limitations recited in this claim have been considered, and construed as functional limitations that add no additional structure to the shutter member. See MPEP 2114. However, because the shutter member of Horiba, as modified by Yonetsu, is structurally similar to that instantly disclosed, it appears capable of functioning as claimed.

Regarding claim 9, the limitations recited in this claim has been addressed above with respect to claim 2.

8. Claim 10 it rejected under 35 U.S.C. 103(a) as being unpatentable over Horiba as applied to claim 5 above, and further in view of Herdeg et al. (US 6,610,433) is maintained.

Horiba is applied and incorporated herein for the reasons above.

Regarding claim 10, Horiba teaches that a fuel supply unit [fuel element 1, cartridge] is placed adjacent to the fuel vessel [chamber 8] through the permeation control film [substrate material (net) 3] (Fig. 2). Horiba also teaches that its fuel elements 1 are held in a bag within the cartridge 2 (3:63-4:1).

However, Horiba does not expressly teach that the fuel supply unit is configured so at to change its volume depending on its internal pressure.

Herdeg teaches a fuel tank for fuel cell systems that can feed fuel to the cell without use of pumps by varying the size of the fuel cavity depending upon the internal pressure of its fuel tank (Abstract; 2:20-24; Fig. 2).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to change the volume of the fuel supply unit of Horiba because Herdeg teaches that this facilitates the feeding of fuel into a system without the use of additional, space-consuming components such as pumps or the like (see Herdeg, Abstract).

9. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Horiba as applied to claim 11 above, and further in view of Gottesfeld (US 6,309,770) is maintained.

Horiba is applied and incorporated herein for the reasons above.

Regarding claim 12, Horiba does not expressly teach that a gas duct through which a gas produced at said fuel electrode is guided to the fuel vessel.

Gottesfeld teaches a fuel cell system that uses effluent gases produced by its anode and cathode to drive the fluids between elements of the system with the assistance of electrically driven pumps (Abstract;

1:52-59). Specifically, anode exhaust gases from its fuel cell (in conduit 84) are delivered to a fuel tank [72] (via conduit 71) (14:1-24, 14:44-48; Fig. 6).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include a gas duct in the fuel cell of Horiba, as taught by Gottesfeld, to drive the movement of fluids between components of the cell without the use an electrically-driven pumps.

Response to Arguments

10. Applicant's arguments filed February 9, 2009 have been fully considered but they are not persuasive.

11. As to applicant's contention that,

> "Applicants" claim 1, as amended, requires a permeation control film that restricts the amount of transmission of the supplementary fuel based on fuel concentration of a liquid fuel in the fuel supply. That is to say, the permeation control film of claim 1, as amended, requires that only gas fuel volatilizing from the supplementary fuel is restrictively transmitted and transferred to the fuel supply. Horiba doesn't teach or suggest this, According to Horiba, the net serves solely to provide structural support to the solidified fuel material, but once the solid material is dissolved in solution, the "net" does nothing to "control" access the flow of fuel through the net. Rather, once the fuel is mixed with water to become liquid fuel "was automatically supplied to the anode." (Horiba Col. 4 lines 29-30, 50-52). Indeed, Horiba states that it is a problem to "prevent the leakage of the fuel at the time of attaching or detaching the cartridge," (Col. 3 lines 16-1 8) and figures 3-4 depict a check valve device for preventing unwanted fuel flow. (Figs 3-4; Col. 3 lines 25-58)." (See applicant's remarks, p. 8.)

It appears that applicant fails to appreciate that these arguments are directed to how the film functions; and, as discussed in the previous Office Action and the rejections above, the polypropylene net of Horiba is capable of performing in this manner. (Further, it should be noted that Prasad is not used to modify the Horiba reference (see applicant's remarks on p. 8). It provides information with respect to the behavior of polypropylene when exposed to a fuel, such as methanol, also a discussed above.)

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Correspondence / Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Edu E. Enin-Okut** whose telephone number is **571-270-3075**. The examiner can normally be reached on Monday-Thursday, 7 a.m. - 3 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer

Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Edu E Enin-Okut/
Examiner, Art Unit 1795

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795